traversed.

Claim 1

Claim 1 is directed to a method of updating a routing table, and recites:

> selecting, from a set of routers, a particular router that is associated with a first time that is a shortest time among all times associated with routers in the set of routers, **wherein the first time has been updated with a previous time taken for a previous data packet to travel to a previous destination indicated by the previous data packet**;
> sending a first data packet to the particular router;
> receiving a second data packet that indicates a second time taken for the first data packet to travel to a destination indicated by the first data packet, wherein the destination indicated by the first data packet is the same as the previous destination indicated by the previous data packet;
> updating the first time based on the second time; and
> updating the routing table based on information contained in the second data packet.
> (Emphasis added)

Claim 1 recites selecting, from a set of routers, a particular router that is associated with a first time that is a shortest time among all times associated with routers in the set of routers, **wherein the first time has been updated with a previous time taken for a previous data packet to travel to a previous destination indicated by the previous data packet**. Claim 1 also recites receiving a second data packet that indicates a second time taken for the first data packet to travel to a destination indicated by the first data packet, wherein the destination indicated by the first data packet is the same as the previous destination indicated by the previous data packet. At least these features are not disclosed in *Teruhi*, *Moy* or *RFC 2676*, taken individually or in combination.

The Office Action admits that Teruhi is silent on "selecting, from a set of routers, a particular router that is associated with a first time that is a shortest time among all times associated with routers in the set of routers, **wherein the first time has been updated with a previous time taken for a previous data packet to travel to a previous destination indicated by the previous data packet**." The Office Action also

admits that *RFC 1247* is silent on the shortest path in terms of traveling time.

The Office Action, however, argues that "RFC2676 teaches the shortest path in terms of traveling time (delay, line 8 of first paragraph in Section 1.2, Page 5), which is the shortest time of the all the previous packets traveled from the set of nodes to the destination node." This is a mischaracterization of the reference. The cited portion of *RFC 2676* reads "Specifically, the extensions to LSAs that we initially consider, include only available bandwidth and delay." That is, according to *RFC 2676*, the Link State Advertisements (LSAs) in OSPF may be enhanced to carry attributes such as available bandwidth and delay. There is no disclosure in this portion or elsewhere in *RFC 2676* that the term "delay" is the shortest time of all previous packets traveled from a set of routers to the destination node, as apparently argued by the Office Action.

For example, the cited portion of *RFC 2676* does not disclose a set of routers. This passage also does not disclose a particular router, from the set of routers, that is associated with a first time that is a shortest time among all times associated with routers in the set of routers. The passage in *RFC 2676* further does not disclose "... **wherein the first time has been updated with a previous time taken for a previous data packet to travel to a previous destination indicated by the previous data packet**." In *RFC 2676*, "delay" is probably only a rough estimate of a link characteristic, such as delay introduced in packet transmission due to bandwidth or carrying capacity issues.

The Office Action argues that *Teruhi* discloses "**receiving a second data packet that indicates a second time taken for the first data packet to travel to a destination indicated by the first data packet**." This is incorrect. There is no disclosure in *Teruhi* that the delay 74 iss a time that a control packet (a RTCP-SR packet) takes to travel from the sender to the receiver. Delay 74 as disclosed in *Teruhi* is in fact the difference

between the receiving time of the last sender report and the generation time of the receiver report. *See* FIG. 9 of *Teruhi*. The delay 74 is not the time of any particular packet traveling from the sender to the receiver. Indeed, even if the sender receives the delay 74 from the receiver, the time for the last sender report to travel from the sender to the receiver cannot be computed, as the time for the receiver report to travel from the receiver to the sender is not known. The Office Action fails to provide any evidence in support of the assertion that receiving a second data packet that indicates a second time taken for the first data packet to travel to a destination indicated by the first data packet is disclosed in *Teruhi*.

RFC 2676 is a proposed extension to the OSPF protocol, specified in *Moy*. Under this proposed extension, link bandwidth and link propagation delay information between two neighboring routers may be exchanged.

RFC 2676 only discloses overall delay information related to a specific link. There is no disclosure in *RFC 2676* that time information for a first data packet over a particular path that consists of links between neighboring routers is carried back by a second data packet, as featured in Claim 1. For example, there is no disclosure in *RFC 2676* that the link delay is a time that a single link state advertisement takes to travel to a neighbor. Therefore, the link state advertisement is not a first data packet as recited in Claim 1.

Examiner's Response to Applicant's Previous Amendments/Remarks

Page 19 of the present Office Action states, "RTCP-SR packet is a Real Time Control Packet. 74 DLSR field of RTCP-SR packet by definition is 'DELAY SINCE LAST SR'. Therefore, when RTCP-SR reaches destination, DLSR is a time a packet to travel to the destination node."

Respectfully, this is a mischaracterization of the reference. "DELAY SINCE LAST SR", as referred to in the reference and by the Office Action, is not a delay of any specific packet. This is clearly shown in FIG. 9 of the reference, where the delay 74 is shown as the difference between the receiving time of the last sender report and the generation time of the receiver report.

Since *Teruhi*, *Moy* and *RFC 2676* fail to disclose the features of Claim 1, any combination of the three cannot disclose every feature of Claim 1.

For the reasons given above, Claim 1 is patentable over *Teruhi, Moy* and *RFC 2676*. Reconsideration is respectfully requested.

Claims 2, 4, 5, and 7

Claims 2, 4, 5, and 7 are dependent upon and thus include each and every feature of Claim 1 discussed above. Therefore, it is respectfully submitted that Claims 2, 4, 5, and 7 are allowable for at least the reasons given above with respect to Claim 1. Reconsideration is respectfully requested.

IV. ISSUES RELATING TO 103(a) —*TERUHI* AND *RFC 2676*

Claims 3 and 6 are rejected under 35 U.S.C. § 103(a) as allegedly obvious over *Teruhi* in view of *RFC 2676*. The rejection is respectfully traversed.

Claims 3 and 6 are dependent upon and thus include each and every feature of Claim 1 discussed above. Therefore, it is respectfully submitted that Claims 3 and 6 are allowable for at least the reasons given above with respect to Claim 1. Reconsideration is respectfully requested.

V. ISSUES RELATING TO 103(a) —*MOY* AND *RFC 2676*

Claims 8 and 18-20 are rejected under 35 U.S.C. § 103(a) as allegedly obvious over *Moy* in view of *RFC 2676*. The rejection is respectfully traversed.

Claims 8 and 18-20 each recite similar features as those discussed above with respect to Claim 1. For example, Claim 18 is a computer-readable medium claim that corresponds to method Claim 1. Claim 19 is recited in a format allowable by 35 USC §112, and corresponds to method Claim 1 discussed above. Claim 20 is an apparatus claim that corresponds to method Claim 1. Therefore, Claims 8 and 18-20 are patentable for at least the same reasons discussed above as to Claim 1. Reconsideration is respectfully requested.

VI. ISSUES RELATING TO 103(a) —*CARO* AND *RFC 2676*

Claims 1-25 are rejected under 35 U.S.C. § 103(a) as allegedly obvious over Gianni Di Caro et al., "AntNet: Distributed Stigmergetic Control for Communications Networks", Journal of Artificial Intelligence Research, 12/1998 (hereinafter *Caro*) in view of *RFC 2676*. The rejection is respectfully traversed.

Caro fails to disclose a number of features in Claim 1. For example, Claim 1 recites "selecting, from a set of routers, a particular router that is associated with a first time that is a shortest time among all times associated with routers in the set of routers, **wherein the first time has been updated with a previous time taken for a previous data packet to travel to a previous destination indicated by the previous data packet**" (emphasis added). On the other hand, *Caro* only discloses selecting a neighbor based on probabilistic values stored in the routing table. There is no disclosure in *Caro* that the probabilistic values are a previous time taken for a previous data packet to travel to a previous destination indicated by the previous data packet, as featured in Claim 1.

The Office Action correctly concedes on page 9 that *Caro* (which the Office Action inadvertently refers to as "Teruhi") "**is silent on** the criterion is that the first packet is predicted to reach the destination in a shortest time (the first time)." However,

the Office Action states that "[i]n the same field of endeavor, RFC 2676 further teaches routing the shortes path in terms of traveling time (delay, line 8 of first paragraph in Section 1.2, Page 5)."

Respectfully, as previously discussed with respect to the 103 rejection involving *RFC 2676*, there is no disclosure in *RFC 2676* for selecting, from a set of routers, a particular router that is associated with a first time that is a shortest time among all times associated with routers in the set of routers, **wherein the first time has been updated with a previous time taken for a previous data packet to travel to a previous destination indicated by the previous data packet**, as featured in Claim 1. *RFC 2676* only discloses overall delay information related to a specific link. There is no disclosure in *RFC 2676* that time information for a first data packet over a particular path that consists of links between neighboring routers is carried back by a second data packet, as featured in Claim 1.

Further, a combination of the two references conflicts with the teaching of at least one of the references, and violates at least one principle of operation of the references.

A probabilistic model is fundamental to the operation of *Caro*. As described in the reference, all the steps, generating packets, selecting neighbor nodes to forward, updating routing information, etc., are all inextricably tied to the probabilistic model. For example, as *Caro* indicates on page 328 (item 7.i), "[t]he **statistical model** has to be able to capture this variability and to follow in a robust way the fluctuations of the traffic. **This model plays a critical role** in the routing table updating process (see item (ii) below)" (emphasis added). Furthermore, according to *Caro*, routing performance is improved under the AntNet because of the use of probabilistic entries (on page 330, "**The use of probabilistic entries is very specific to AntNet** and we observed it to be

effective, improving the performance, in some cases, even by 30%-40%. Routing tables are used in **a probabilistic way not only** by the ants **but also** by the data packets. This **has been observed to improve** AntNet performance, which means that the way the routing tables are built in AntNet is **well matched with a probabilistic distribution** of the data packets over all the good paths" (emphasis added)).

A combination of *RFC 2676* and *Caro*, as suggested by the Office Action, completely vitiates the advantages gained by the probabilistic model of *Caro*, rendering the critical role played by the probabilistic model in *Caro* unfulfilled.

In response, page 3 of the Office Action argues as follows:

> … the probabilistic model of Caro is used for collecting routing information for the routing database, while RFC 2676 specifies the criterion for selecting routing path based on information of the routing database. There is no violation of principles of operation because each addresses a separate and independent aspect of the optimal routing path finding.

This argument is based on mischaracterization *Caro* in a number of key aspects. *Caro* describes an AntNet in which entries in a routing table (*See* Fig. 1 on page 325) stores probabilistic values calculated based on the statistics collected by ant packets. According to *Caro*, ant packets are generated periodically (item 1 on page 326). The destinations of the ant packets are **statistically determined by formula (2)**, which is **statistically based on the data traffic pattern**. *Id.* At **each** intermediate node, **each** ant packet, known as traveling agent, is sent to a neighbor that is selected based on a **probability determined by the probabilistic values stored in the routing table (*see* item 3 on page 327 of *Caro*; formulas (3) and (4) therein)**. A backward ant is sent back on the same path after the ant packet arrives at its destination (item 6 on page 328). The information carried by the backward ant is then used to update the probabilistic values in the routing table (*see, e.g.,* formulas (5) and (6) on page 329).

For these reasons, a proposed combination of *Caro* and *RFC 2676* violates at least one principle of operation of the references.

Moreover, the Office has rejected the claims based on the theory that a skilled artisan would **combine** the references to yield the invention. To now contend that the references are cited for separate and independent aspects is totally inconsistent with a rejection based on the combination. The Office cannot simultaneously argue that a person of skill would combine references while ignoring parts of the references that would direct the skilled person in a different direction, or would lead the skilled person not to combine them.

Claims 8, 9 and 18-20

Claims 8, 9 and 18-20 each recite similar features as those discussed above with respect to Claim 1. For example, Claim 18 is a computer-readable medium claim that corresponds to method Claim 1. Claim 19 is recited in a format allowable by 35 USC §112, and corresponds to method Claim 1 discussed above. Claim 20 is an apparatus claim that corresponds to method Claim 1. Therefore, Claims 8, 9 and 18-20 are patentable for at least the same reasons discussed above as to Claim 1. Reconsideration is respectfully requested.

Claims 2-7, 10-17 and 21-25

Claims 2-7, 10-17 and 21-25 are dependent upon and thus include each and every feature of Claim 1 discussed above. Therefore, it is respectfully submitted that Claims 2-7, 10-17 and 21-25 are allowable for at least the reasons given above with respect to Claim 1.

VII. CONCLUSION

For the reasons set forth above, Applicant respectfully submits that all pending claims are patentable over the art of record, including the art cited but not applied. Accordingly, allowance of all claims is hereby respectfully solicited.

The Examiner is respectfully requested to contact the undersigned by telephone if it is believed that such contact would further the examination of the present application.

Respectfully submitted,

HICKMAN PALERMO TRUONG & BECKER LLP

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/ZhichongGu#56543/
Zhichong Gu
Reg.No. 56,543

2055 Gateway Place, Suite 550
San Jose, CA 95110
Telephone No.: (408) 414-1080
Facsimile No.: (408) 414-1076